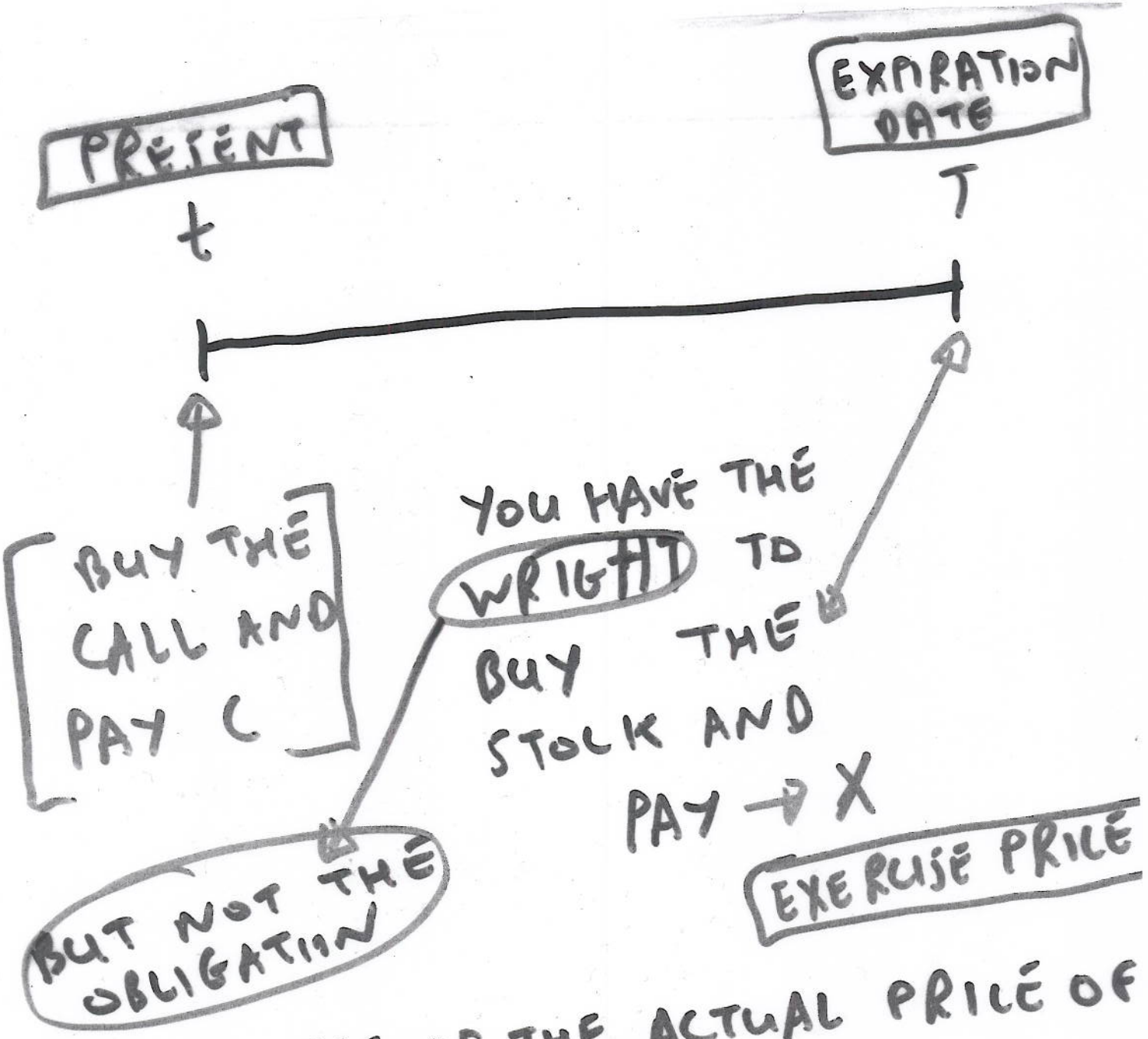


REGARDLESS OF THE ACTUAL PRICE OF THE STOCK (IN THE MARKET) S_T.

SO YOU EXERCISE THE CALL (BUY THE STOCK AND PAY X) WHEN $X < S_T$.

IN THIS CASE YOU GAIN $S_T - X$

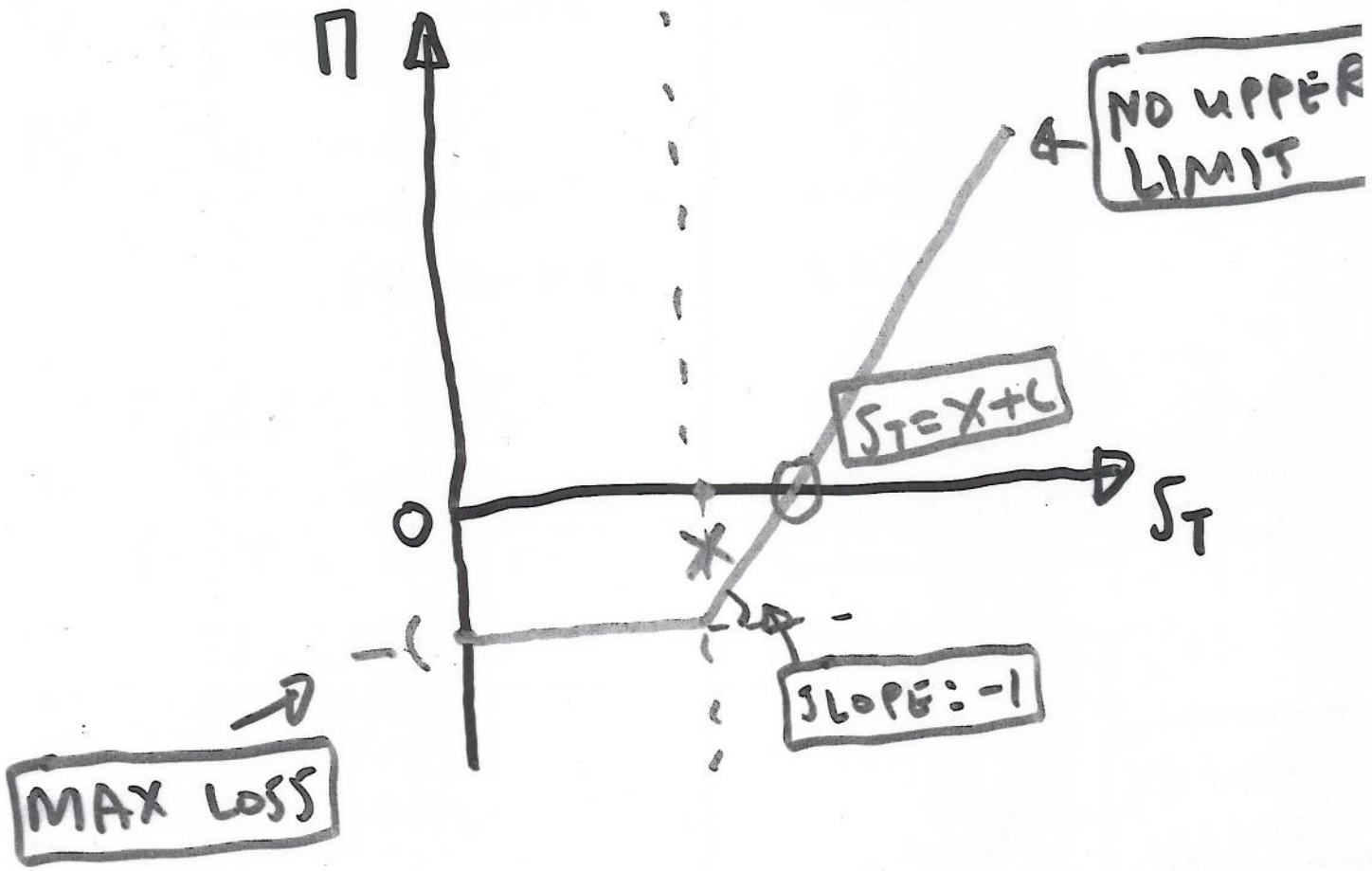
IF $X > S_T$ YOU DO NOT EXERCISE THE GAIN IS 0

LONG POSITION IN A CALL

PROFIT: $\underbrace{\max(S_T - X, 0)}_{\text{REVENUE}} - \underbrace{C}_{\text{COST}}$

$S_T < X$: $-C$

$S_T > X$: $S_T - X - C \rightarrow \boxed{S_T = X + C \Rightarrow \Pi = 0}$

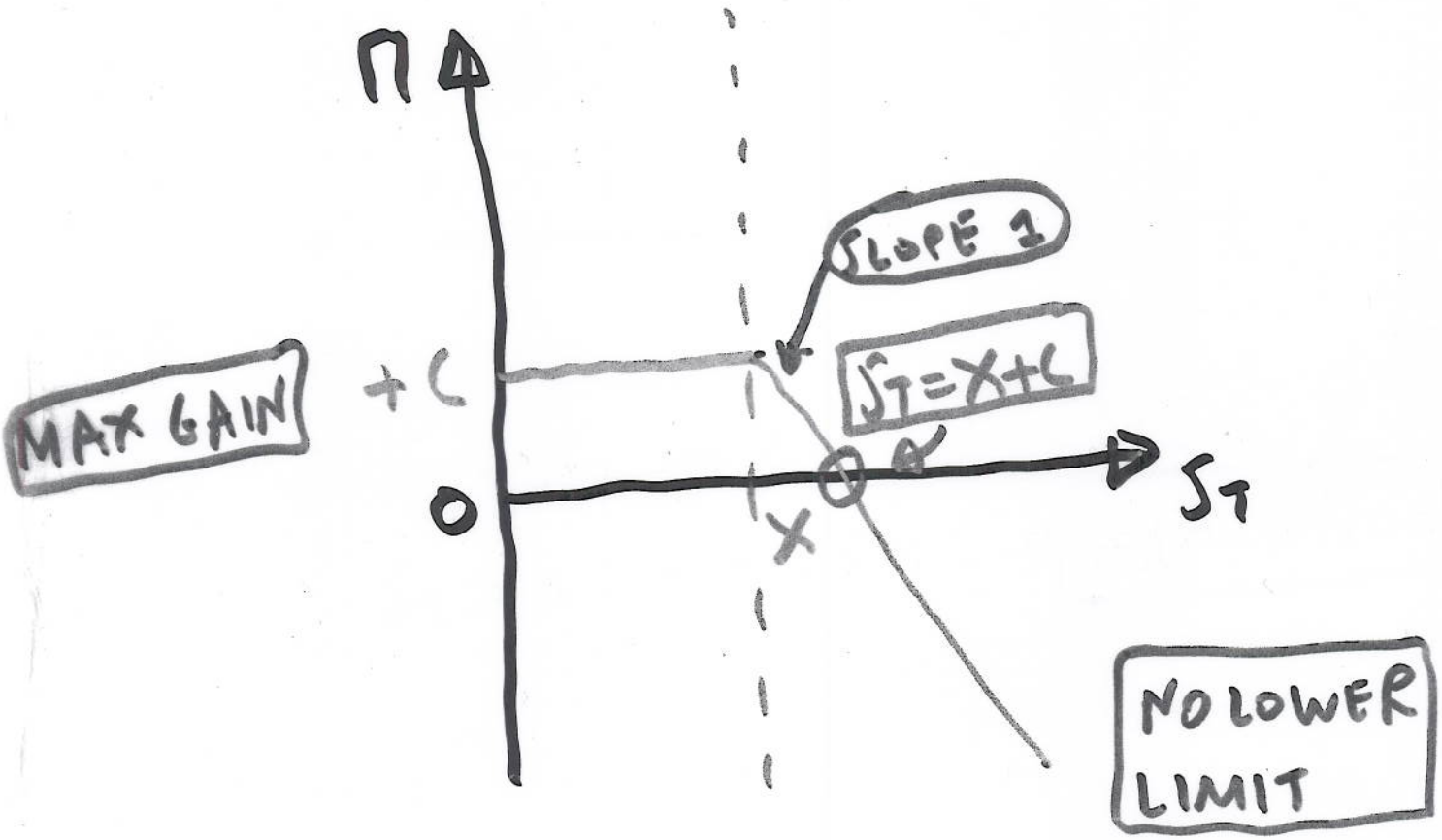


SHORT POSITION IN A CALL

PROFIT:

$S_T < X : +C$

$S_T > X : -S_T + X + C \rightarrow S_T = X + C \Rightarrow \Pi = 0$



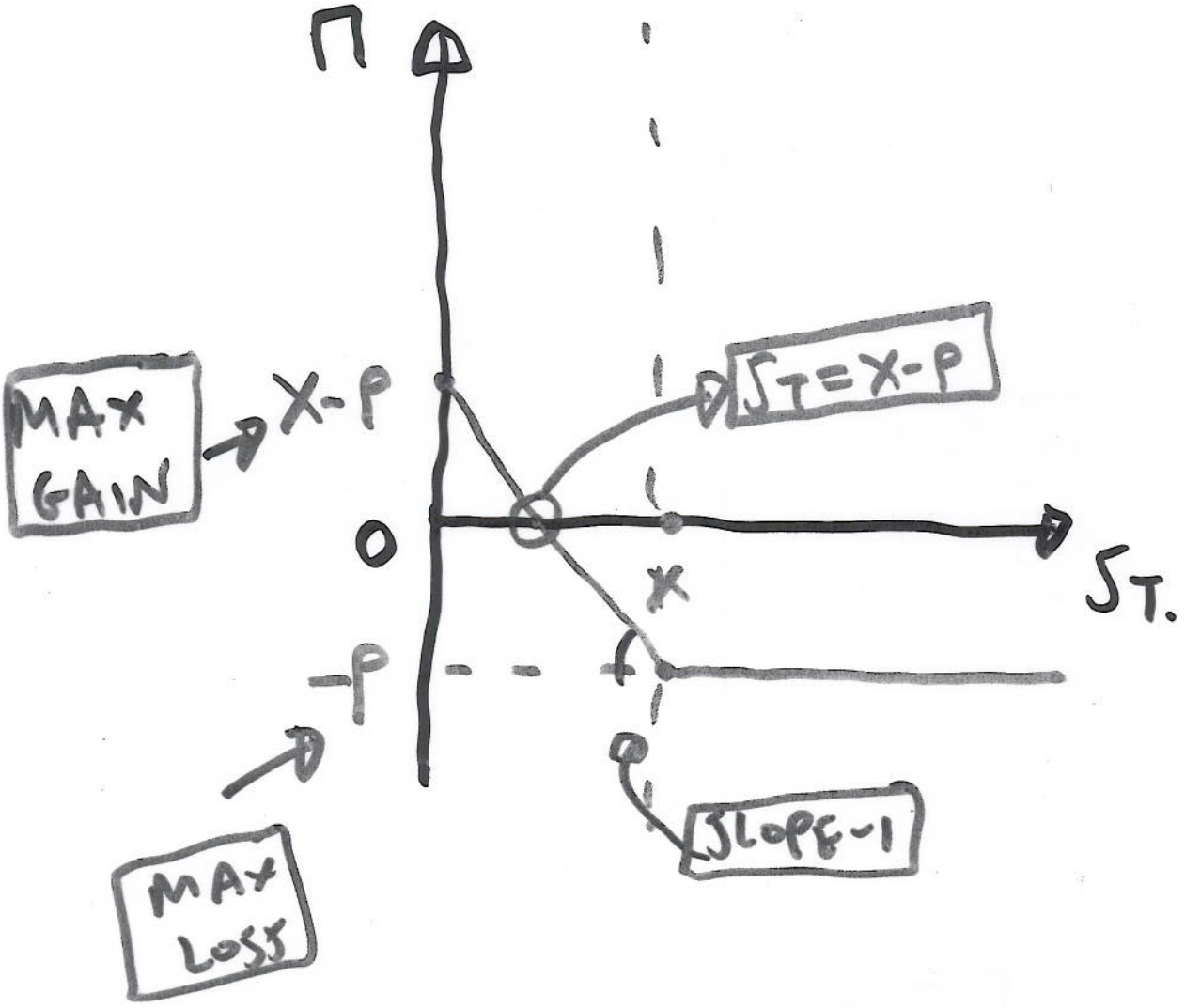
LONG POSITION IN A PUT

PROFIT: $\max(X - S_T, 0) - P$ → COST

(REVENUE)

$S_T < X$: $X - S_T - P$ ⇒ $S_T = X - P \Rightarrow \Pi = 0$

$S_T > X$: $-P$ ⇒ $S_T = 0 \Rightarrow \Pi = X - P$

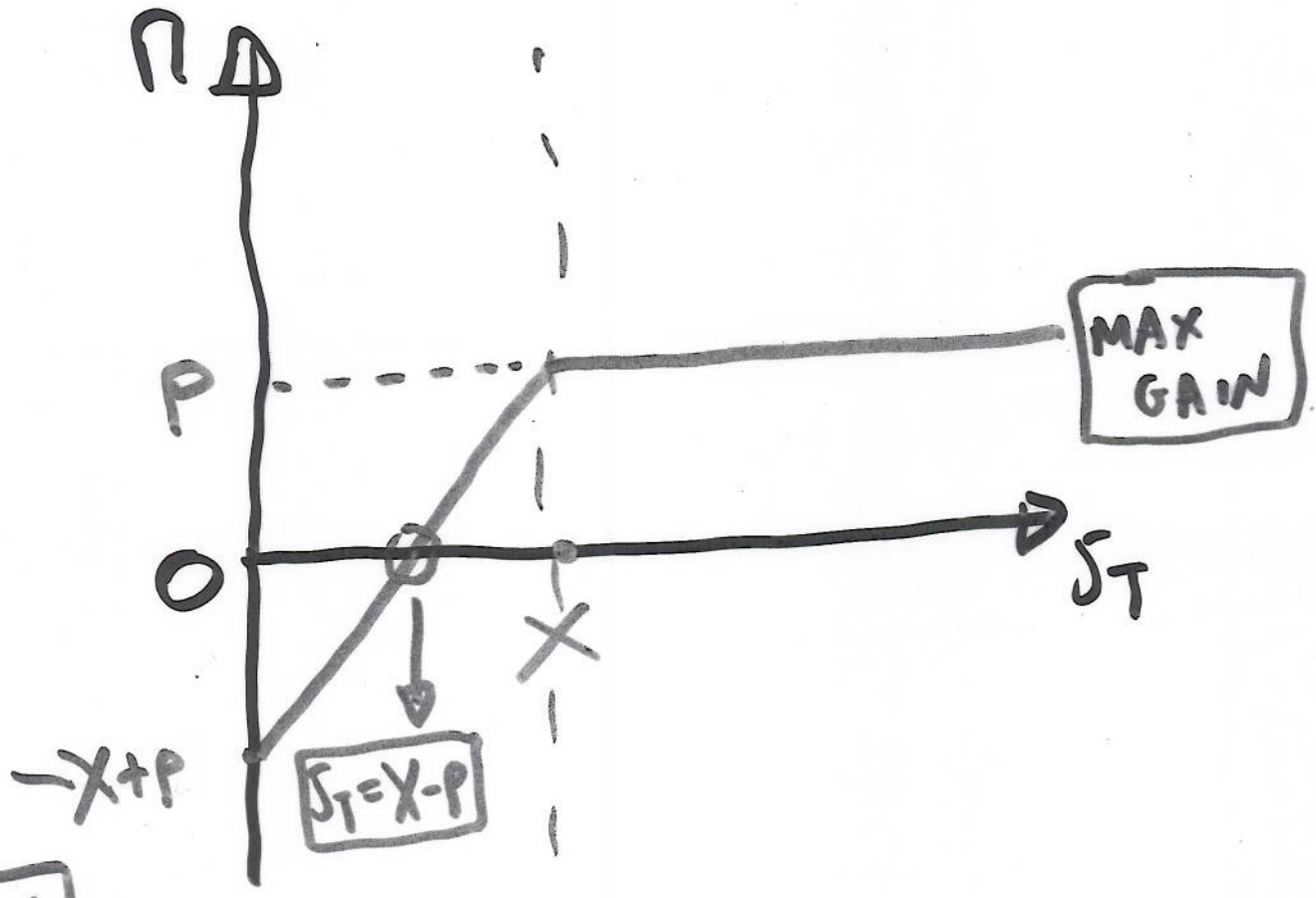


SHORT POSITION IN A PUT

PROFIT: $S_T < X$: $-X + S_T + P$ → $S_T = 0 \Rightarrow \Pi = -X + P$

$S_T = X - P \Rightarrow \Pi = 0$

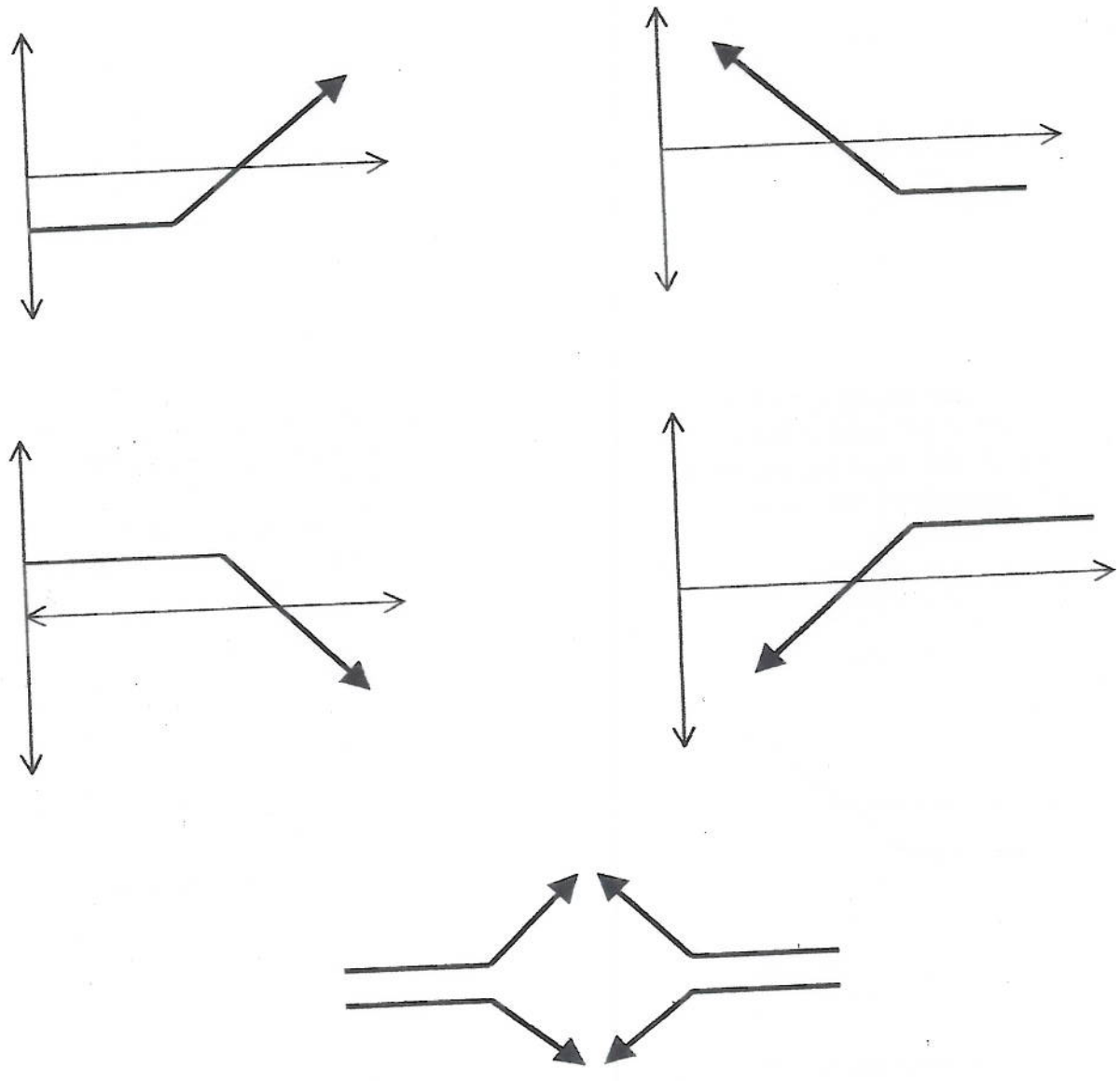
$S_T > X$: P



MAX LOSS

Figure 2

The figure below displays the profit and loss profiles of the four basic options strategies plotted against each other. In this figure, the held and written call options profiles are displayed on the left hand side and the puts on the right hand side. In the bottom, these four profiles have been grouped together. Note that the resultant pattern resembles the shape of a diamond.



WRITING A COVERED CALL

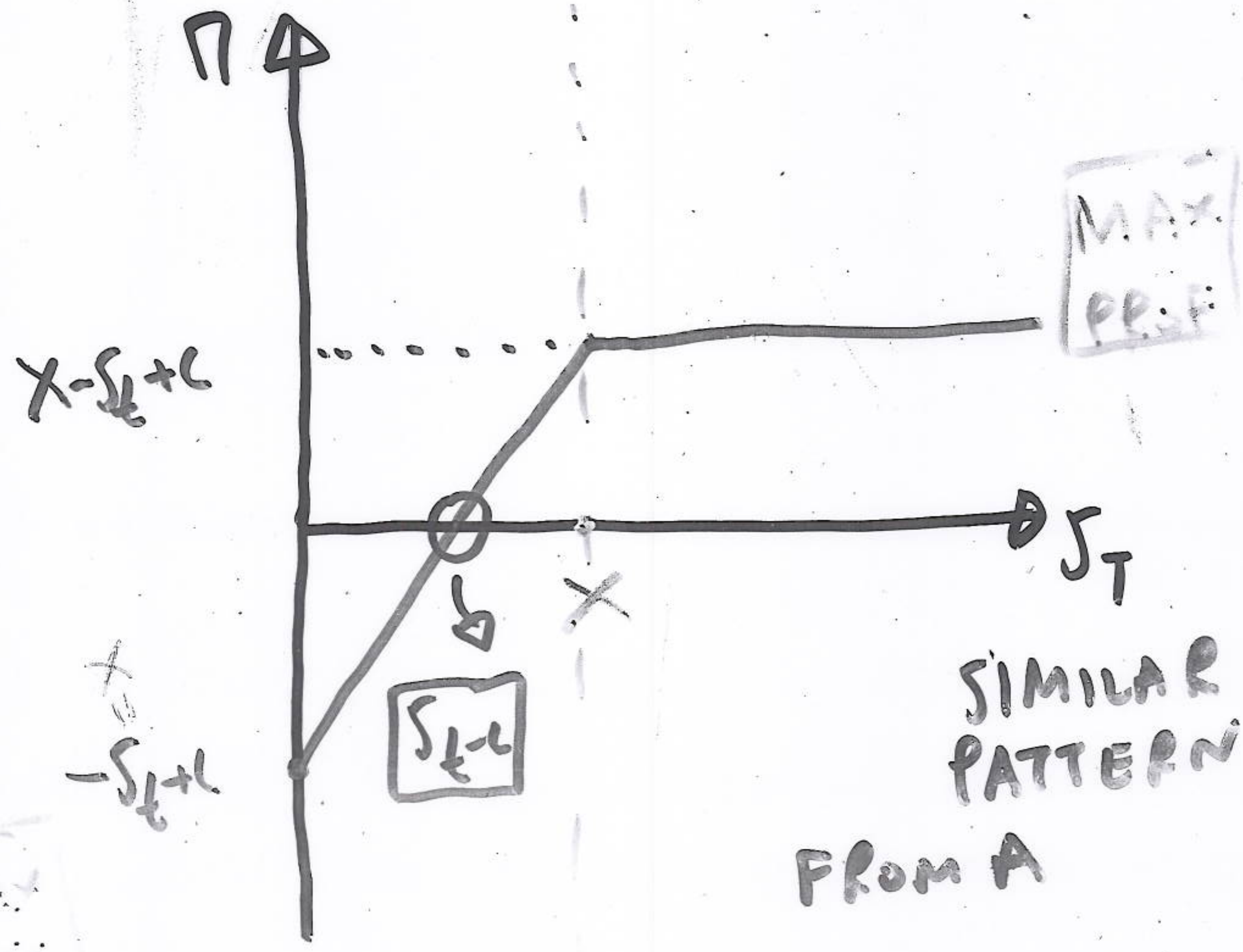
lp in S_t, sp in C COST

$\Pi: S_T - \max(S_T - X, 0) - S_t + C$

$S_T < X: S_T - S_t + C \rightarrow S_T = 0 \rightarrow \Pi = -S_t + C$

$S_T > X: S_T - (S_T - X) - S_t + C = X - S_t + C$

$\Pi = 0 \Rightarrow S_T = S_t - C$

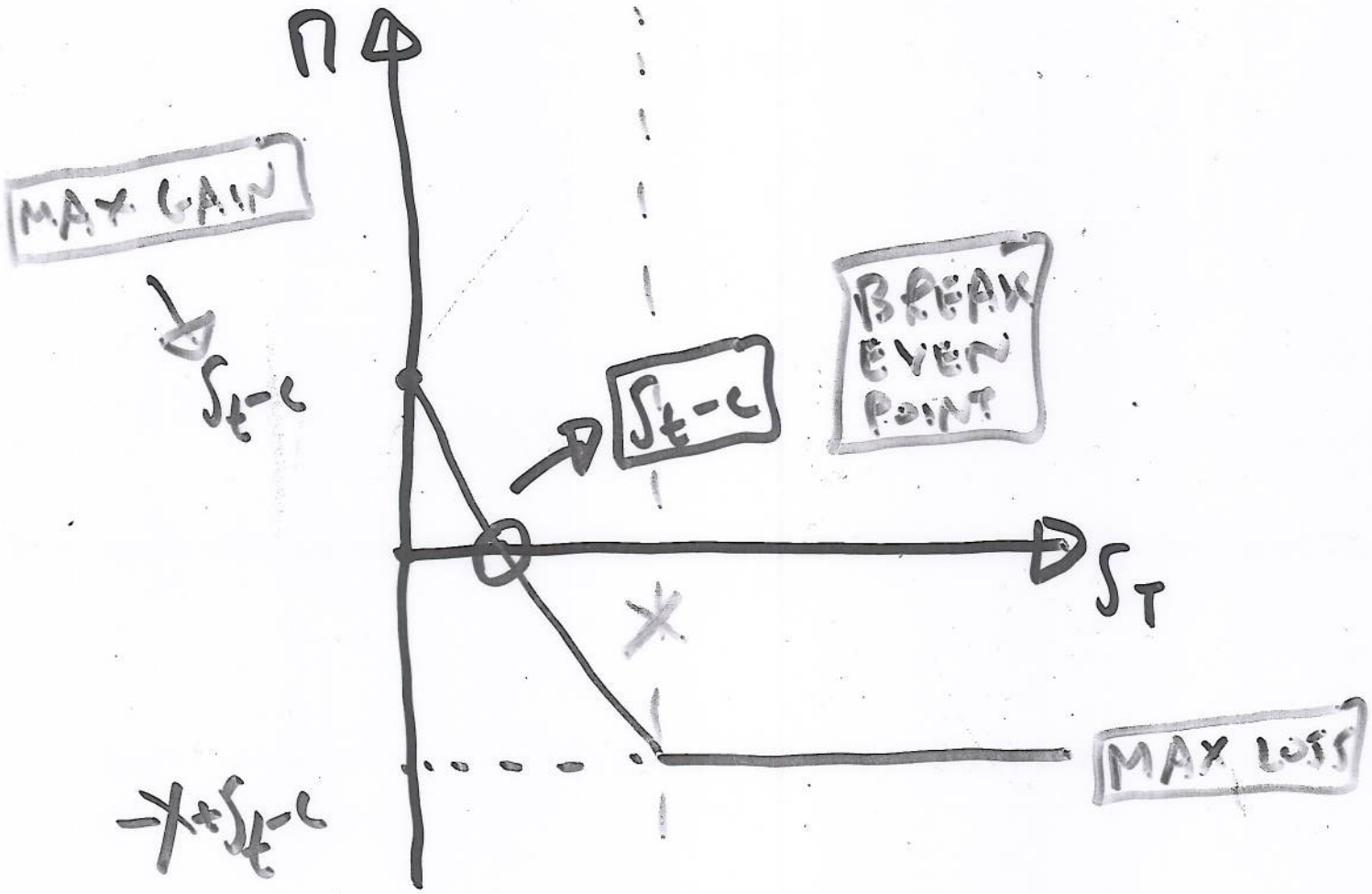


SIMILAR PATTERN FROM A

REVERSE OF WRITING A COVERED CALL

Π: $S_T < X$: $-S_T + S_t - C$ → $S_T = 0 \Rightarrow \Pi = S_t - C$

$S_T > X$: $-X + S_t - C$ → $\Pi = 0 \Rightarrow S_T = S_t - C$



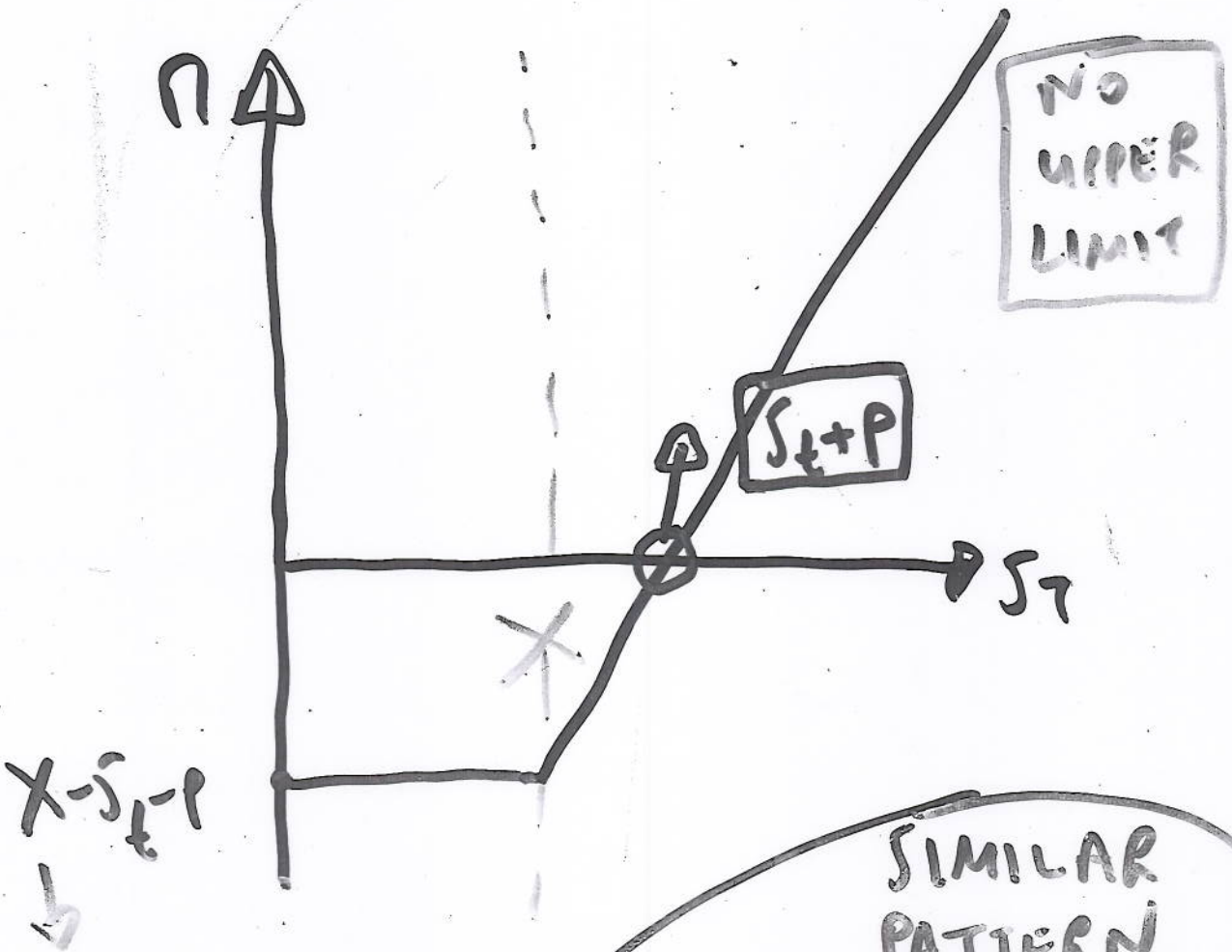
PROTECTIVE PUT STRATEGY

$\uparrow p$ in S_t, $\uparrow p$ in P (COST)

Π: $+S_T + \max(X - S_T, 0) - S_t - P$

$S_T < X$: $S_T + (X - S_T) - S_t - P = X - S_t - P$

$S_T > X$: $S_T - S_t - P \rightarrow \Pi > 0 \Rightarrow S_T > S_t + P$



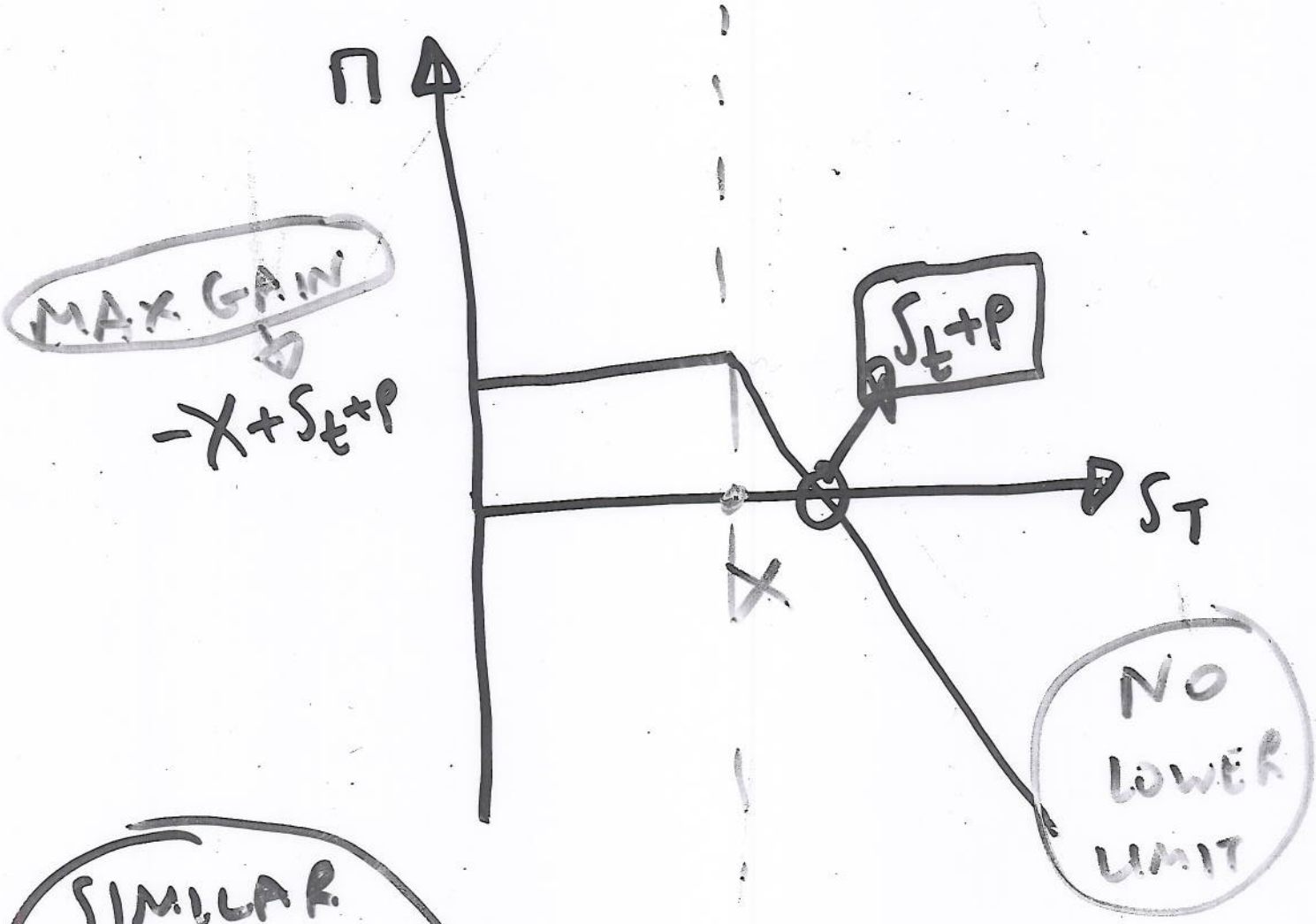
SIMILAR PATTERN FROM A LONG CALL POSITION

REVERSE OF PROTECTIVE PUT STRATEGY

Spin S_t, spin P

Π: $S_T < X: -X + S_t + P$

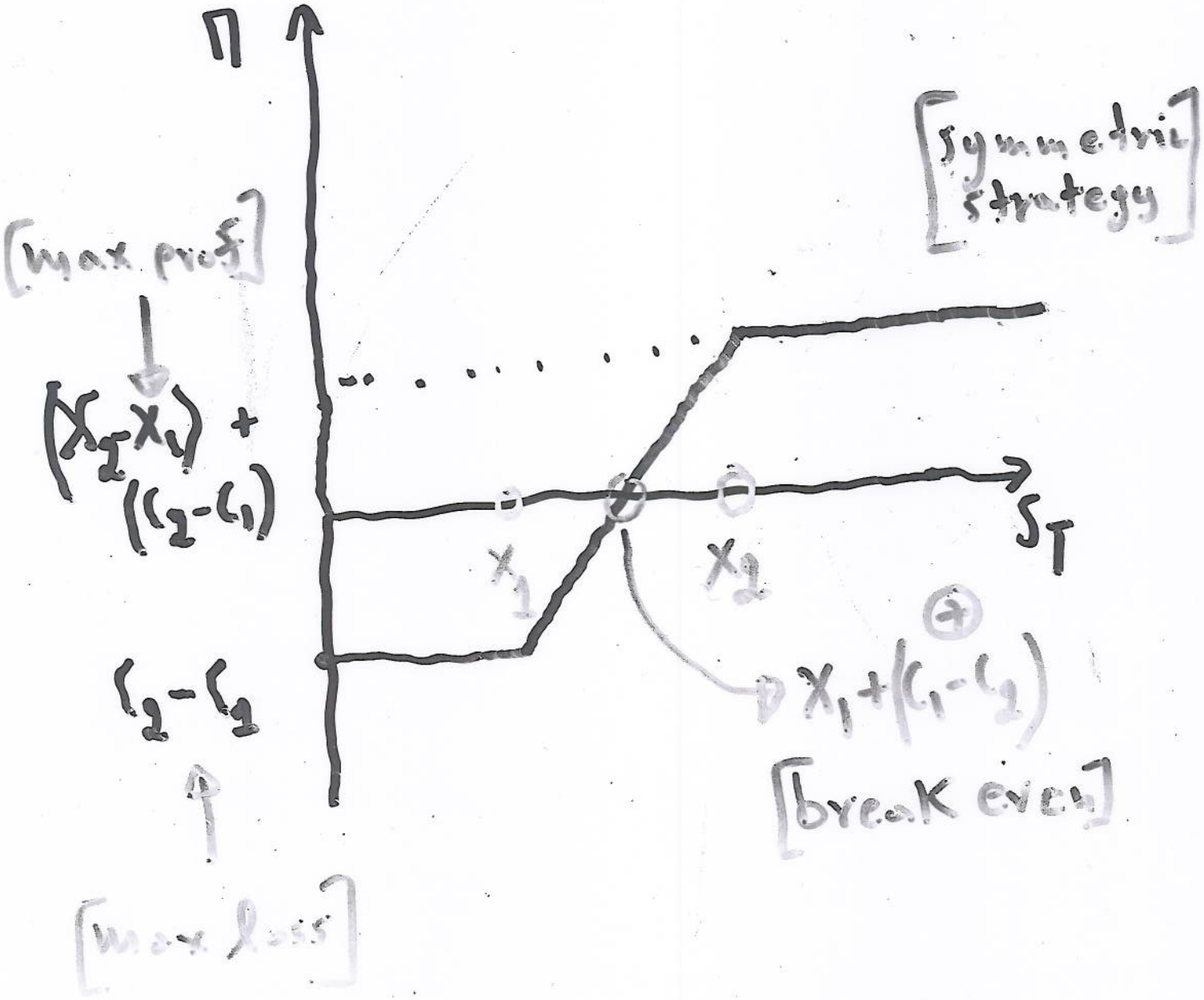
$S_T > X: -S_T + S_t + P \rightarrow \Pi = 0 \Rightarrow S_T = S_t + P$



SIMILAR PATTERN FROM A SHORT CALL POSITION

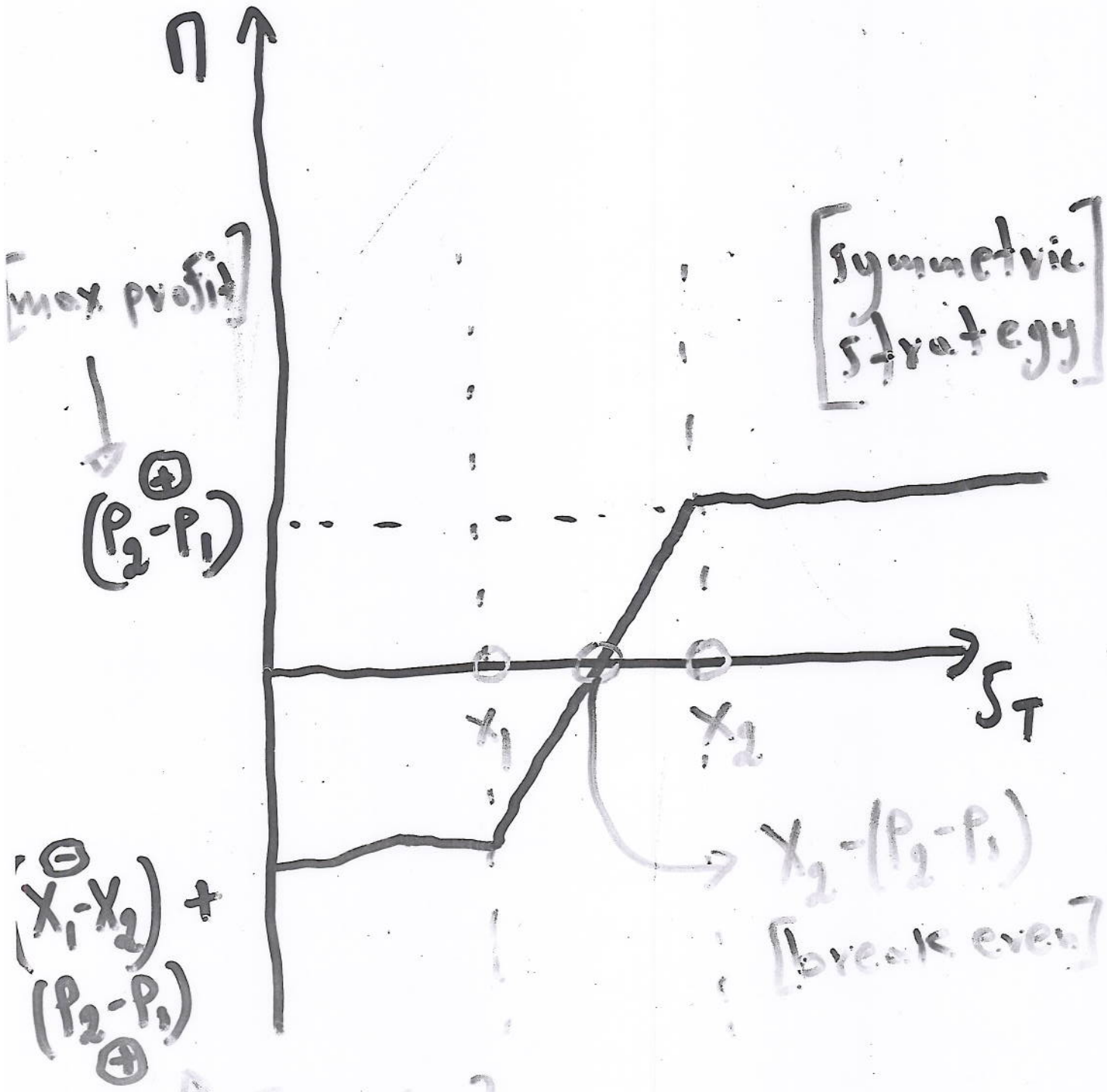
BULL SPREAD (CALLS)

$lp\ C(X_1), sp\ C(X_2), X_2 > X_1$



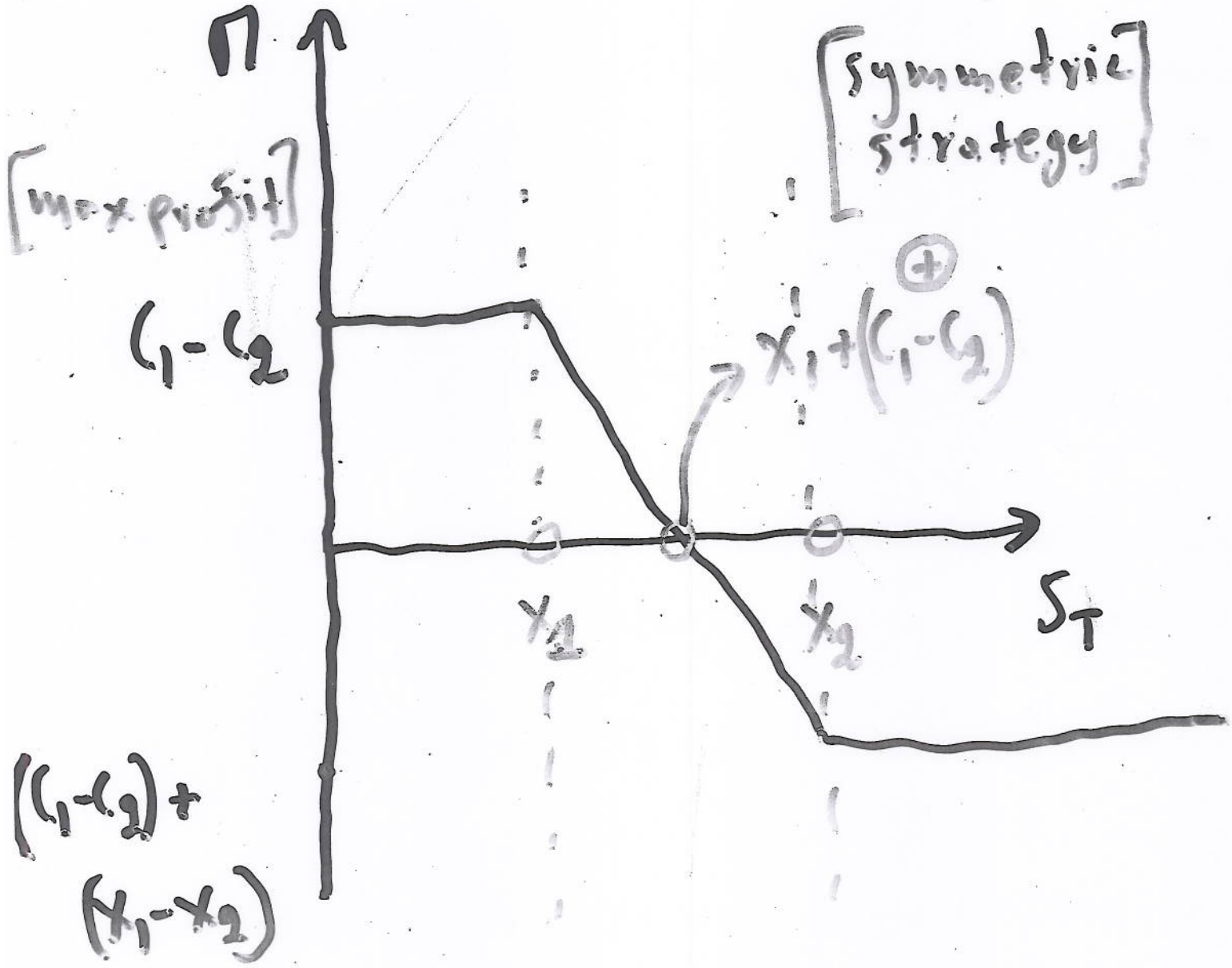
BULL SPREADS (PUTS)

$l_P\ P(X_1)$, $l_P\ P(X_2)$, $X_2 > X_1$



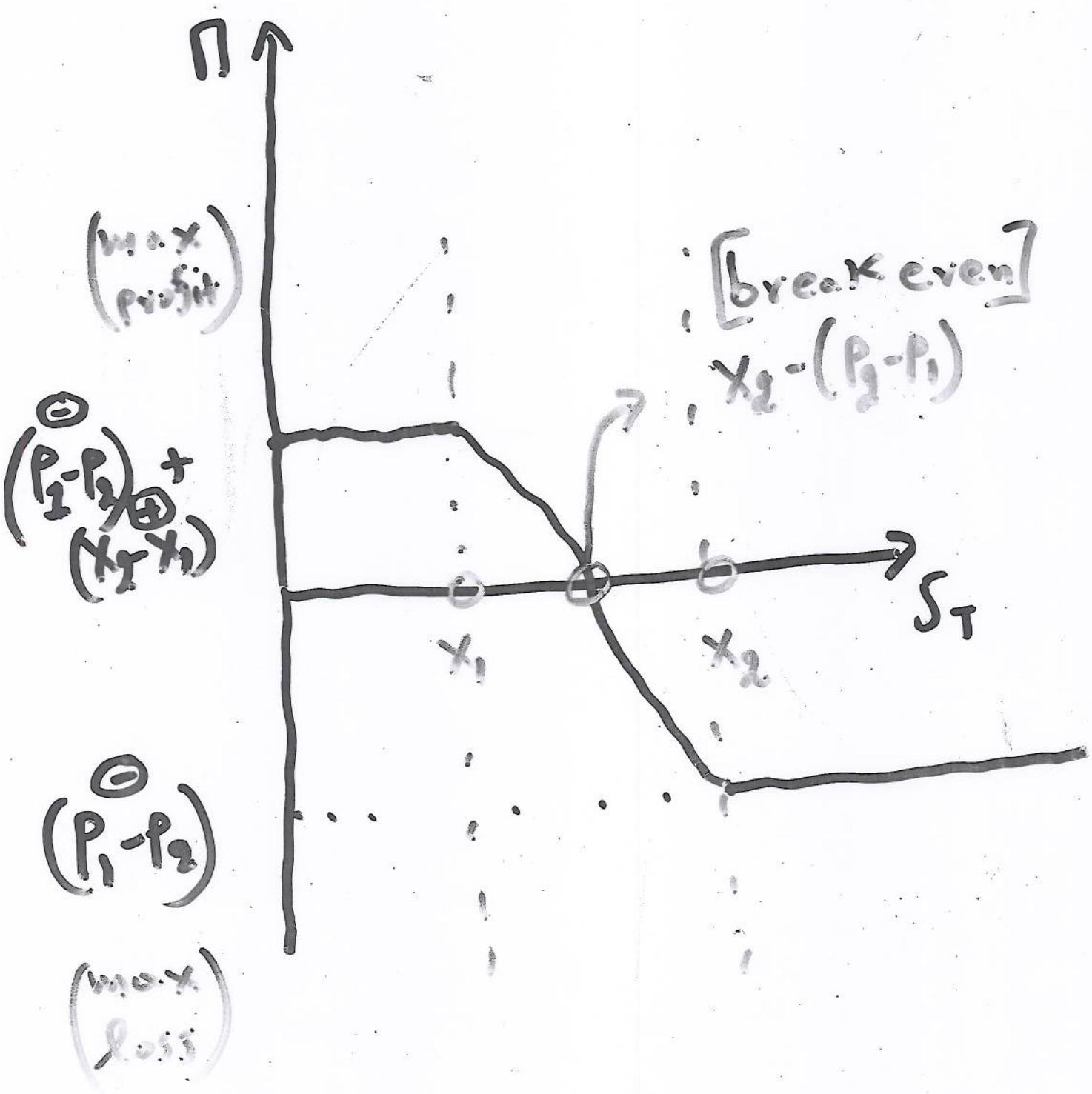
BEAR SPREAD (CALLS)

SP (X_1), SP (X_2), $X_2 > X_1$



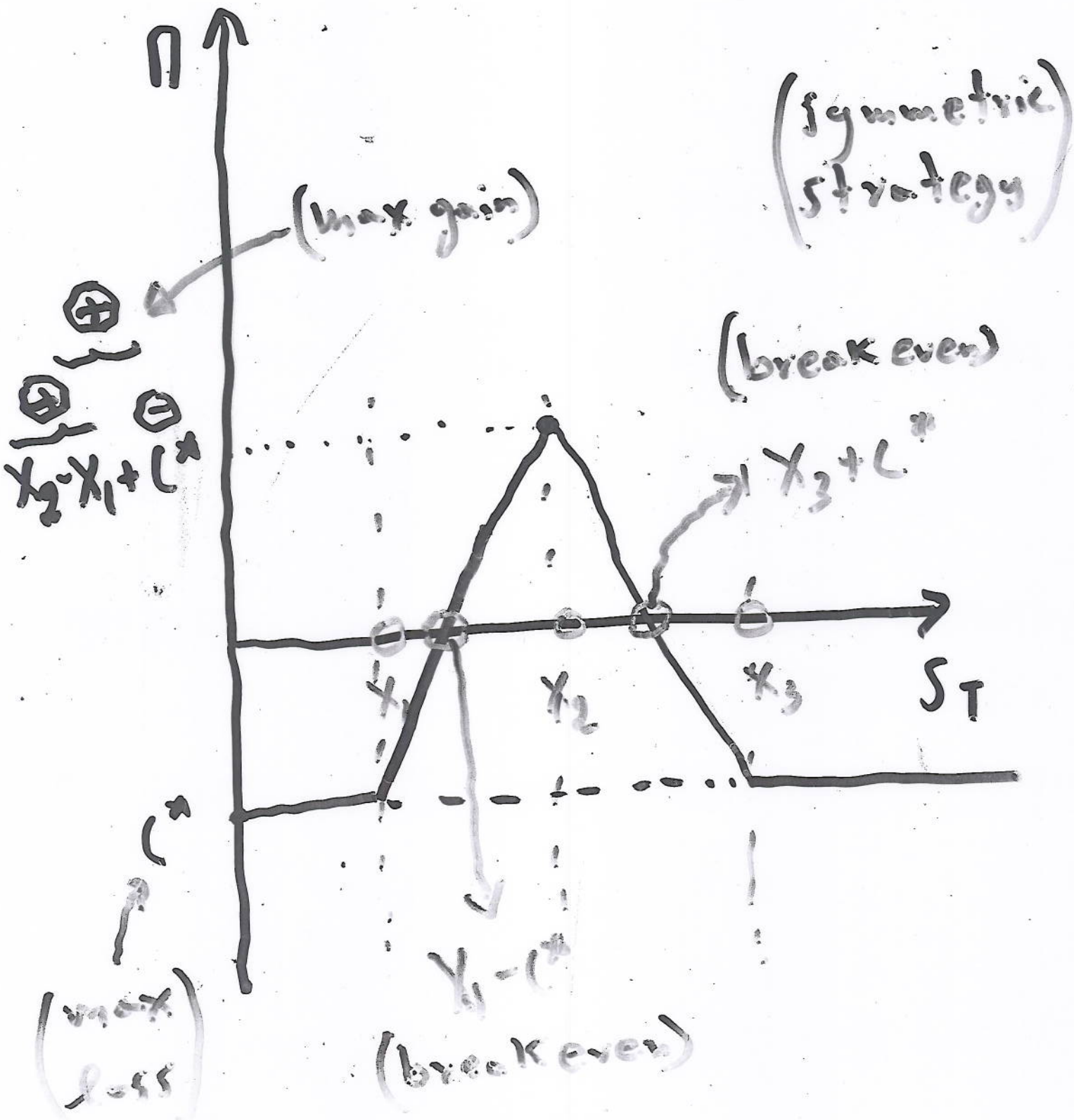
BEAR SPREAD (PUTS)

sp $P(X_1)$, sp $P(X_2)$, $X_2 > X_1$



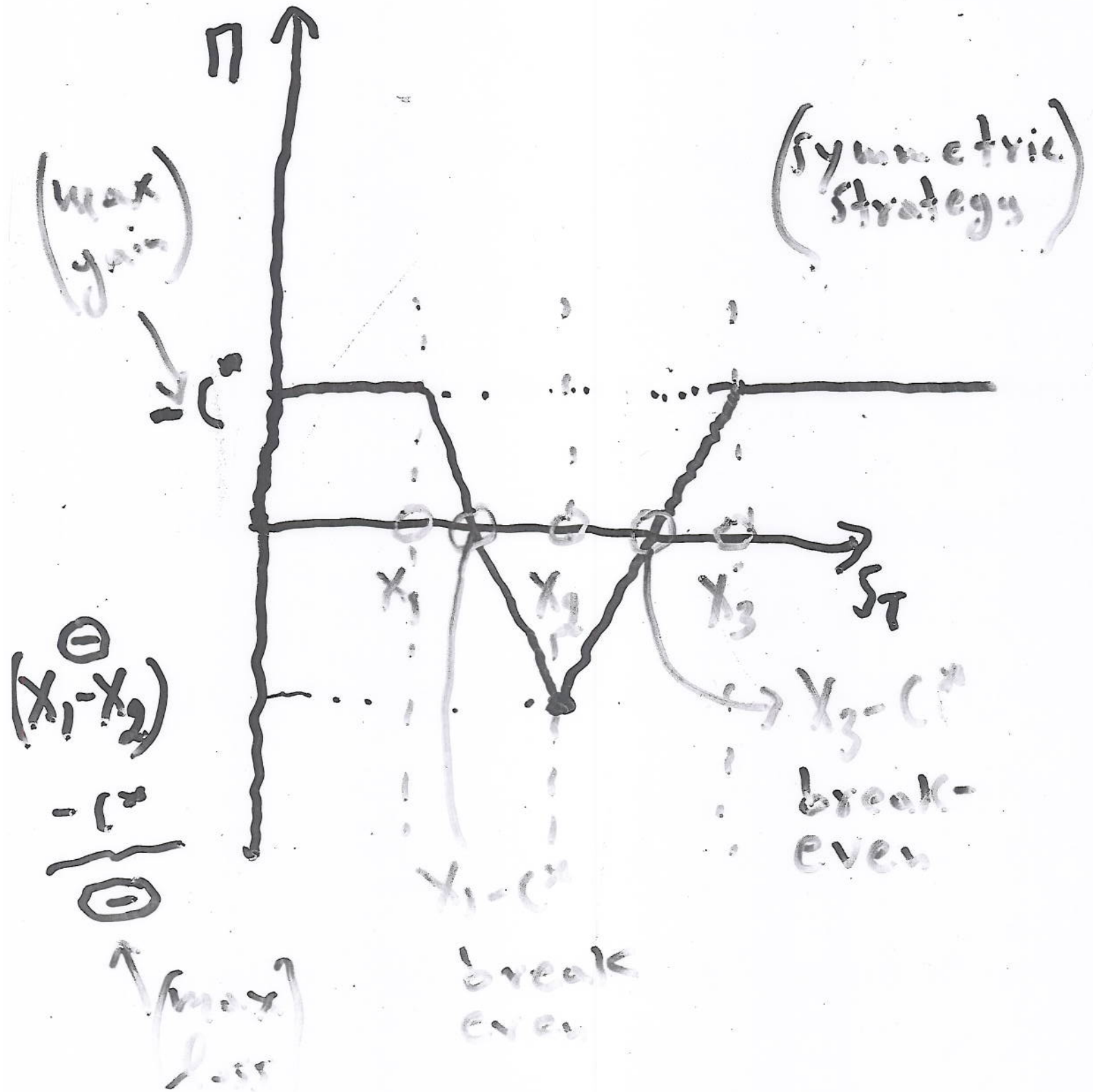
BUTTERFLY SPREAD (CALLS)

$2p\,c(X_1)$, $2sp\,c(X_2)$, $1p\,c(X_3)$ $\quad X_2 = \frac{X_1 + X_3}{2}$



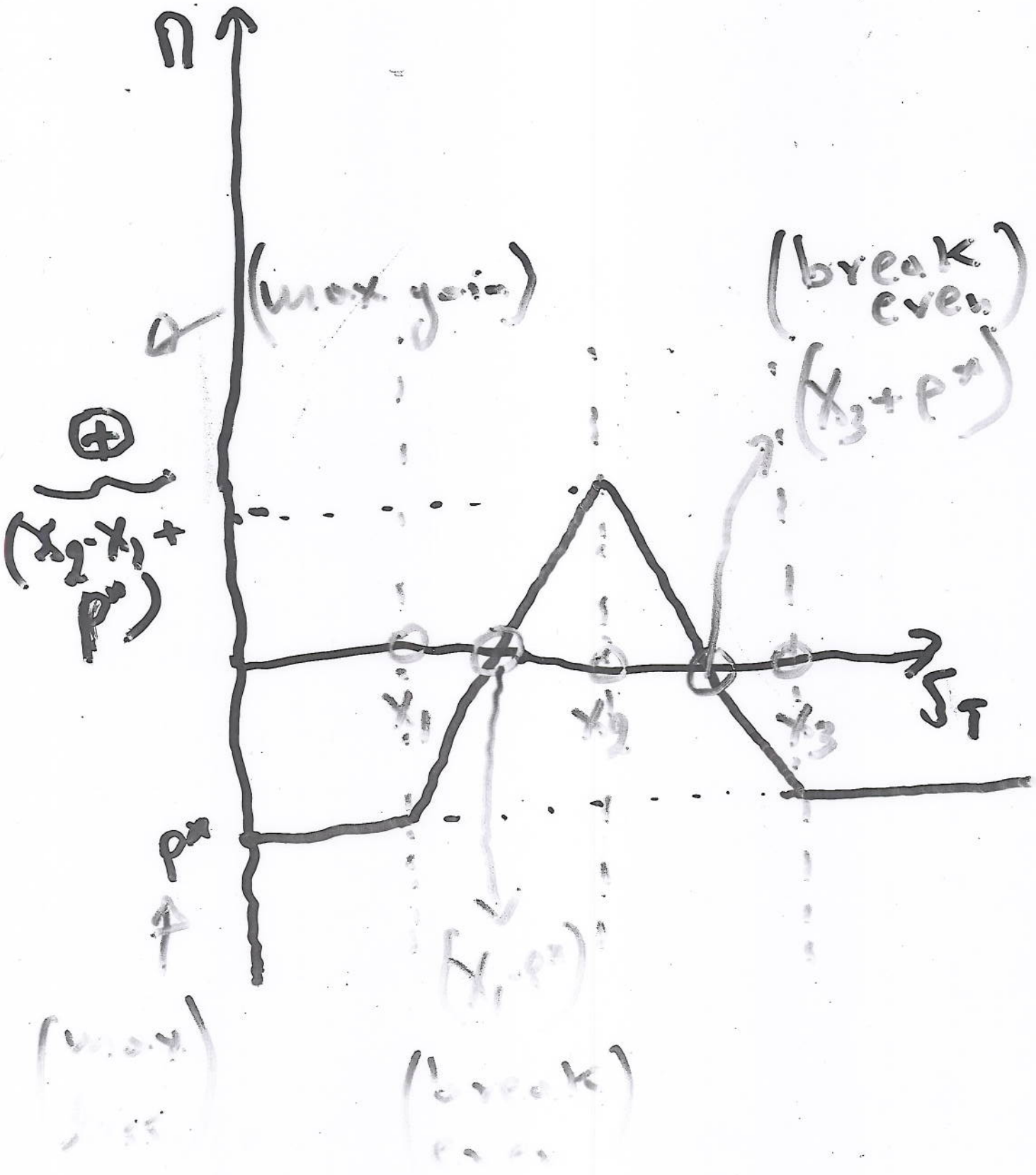
REVERSE BUTTERFLY SPREAD (CALLS)

$+p\,C(X_1)$, $-2p\,C(X_2)$, $+p\,C(X_3)$, $X_2 = \frac{X_1+X_3}{2}$



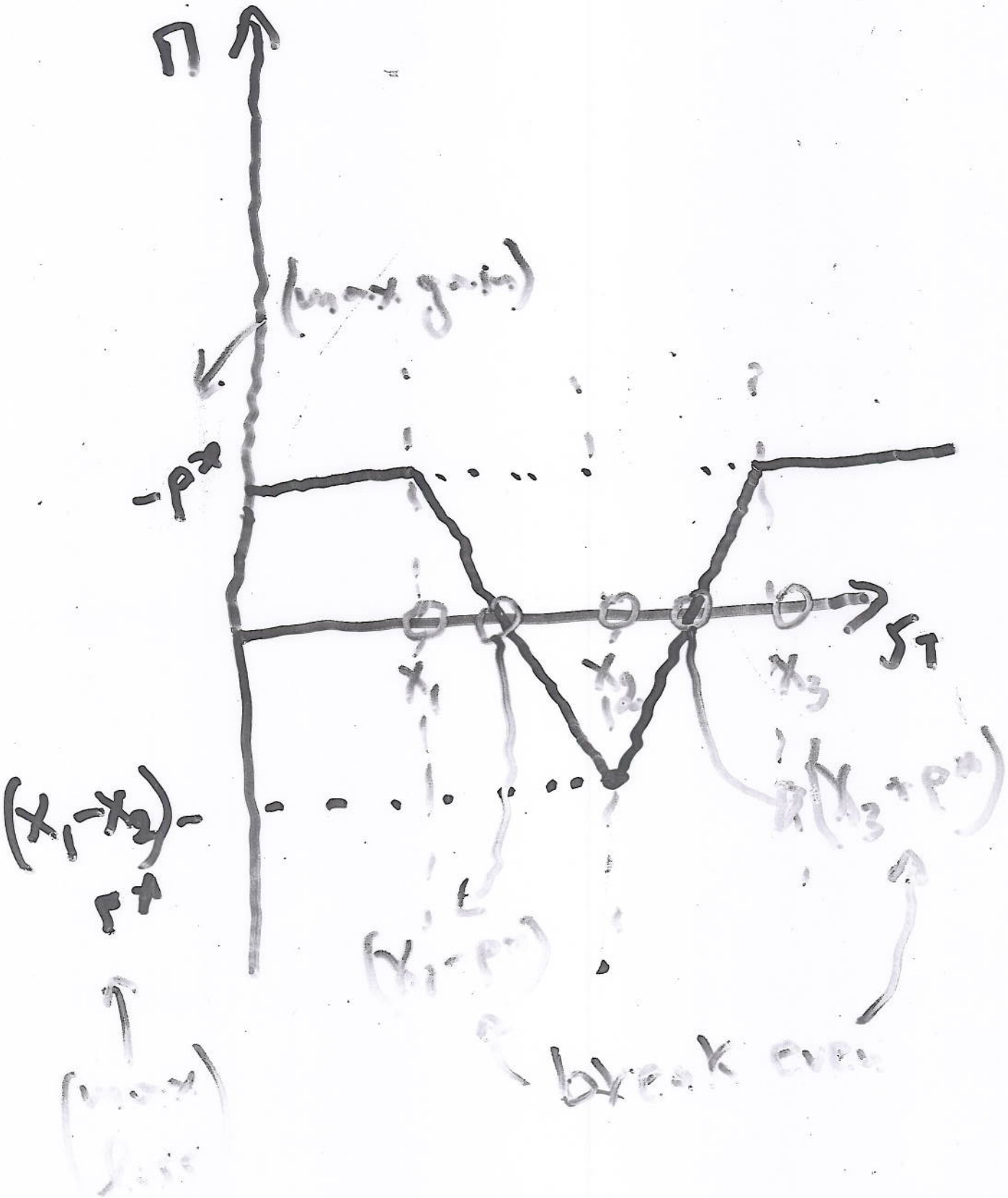
BUTTERFLY SPREAD (PUTS)

$1_P\ P(X_1)$, $2s_P\ P(X_2)$, $1_P\ P(X_3)$, $X_2 = \frac{X_1 + X_3}{2}$



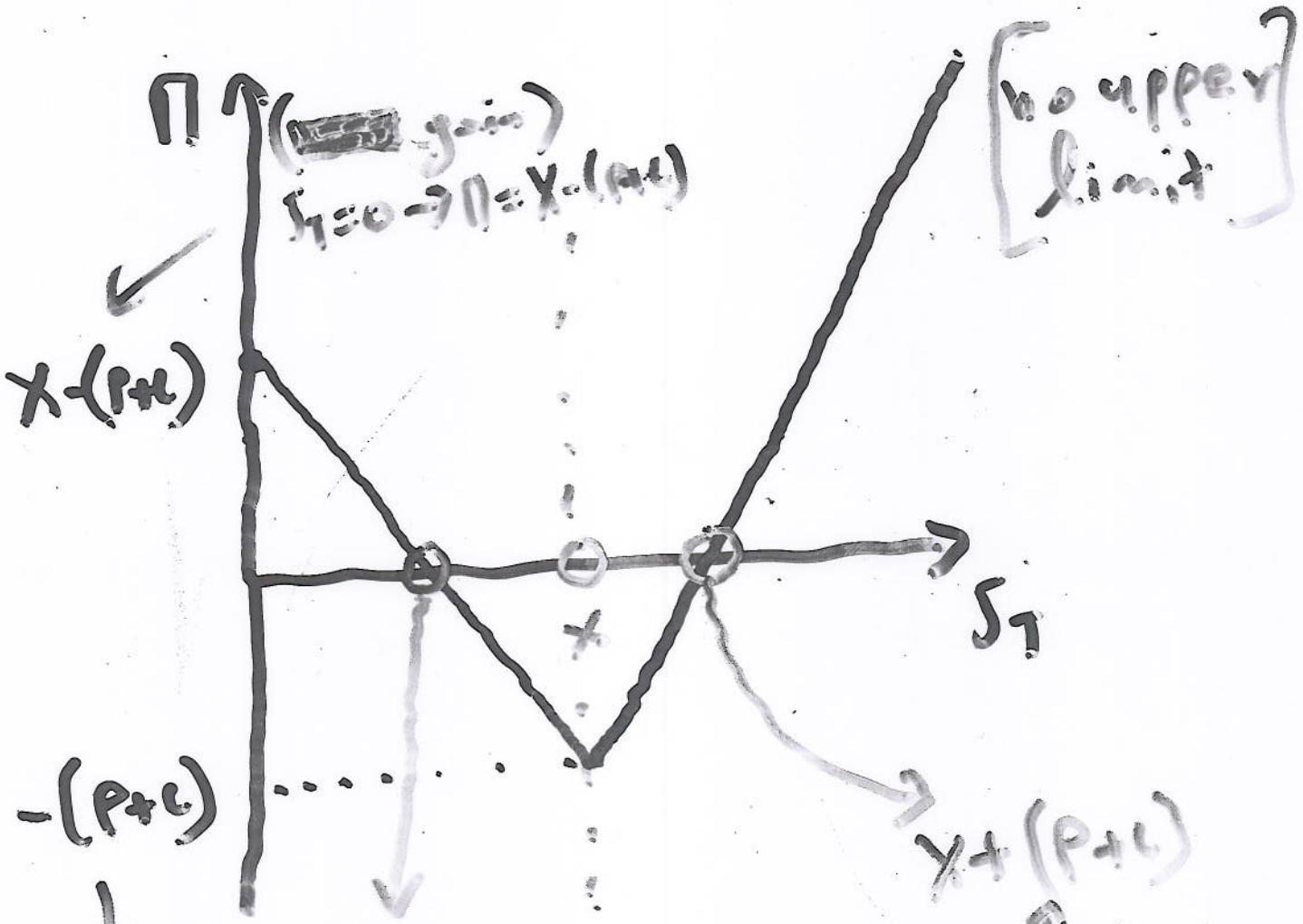
REVERSE BUTTERFLY SPREAD (PUTS)

sp P(X_1), 2 lp P(X_2), sp P(X_3), $X_2 = \frac{X_1 + X_3}{2}$



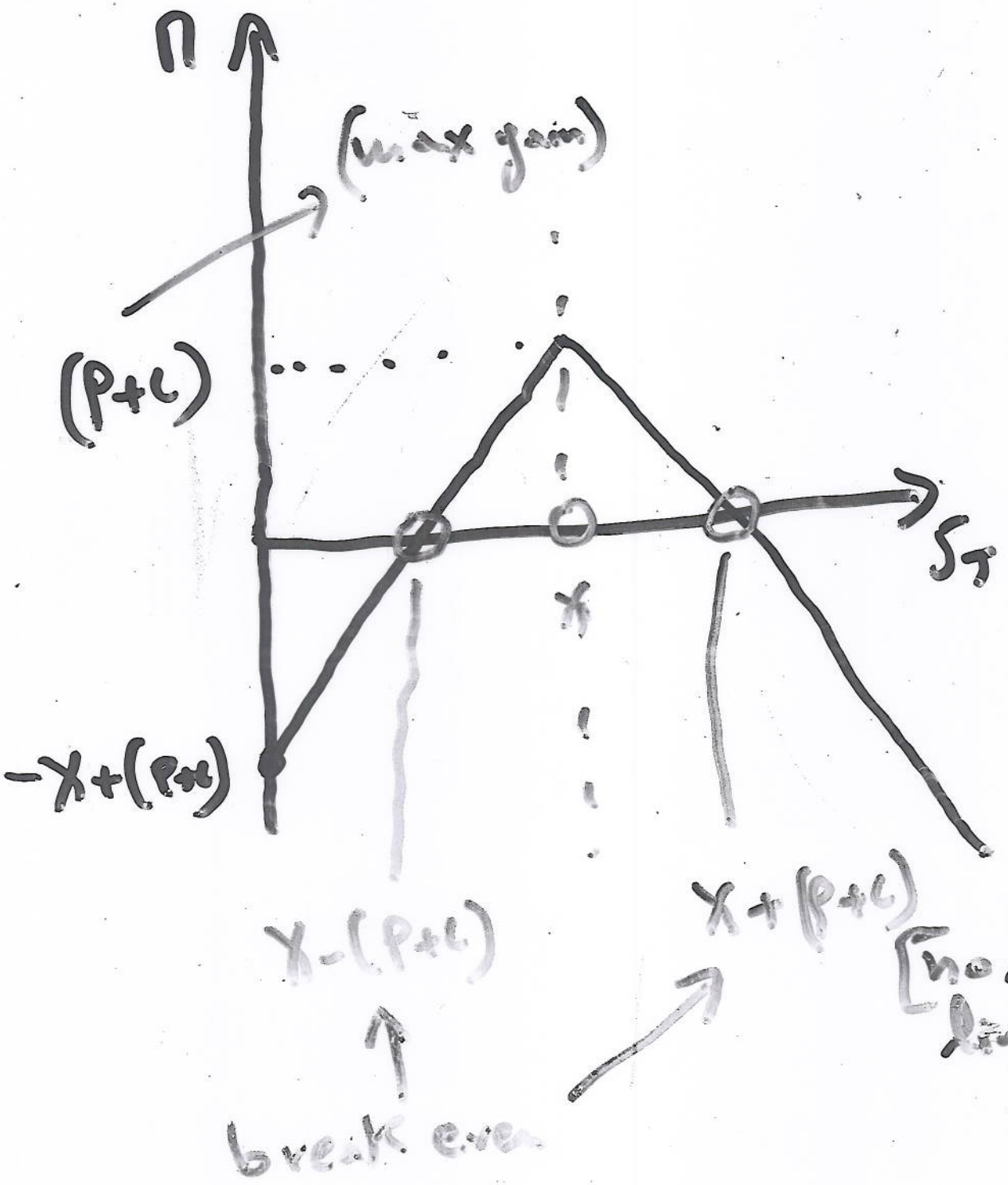
STRADDLE

If $C(X)$, If $P(X)$



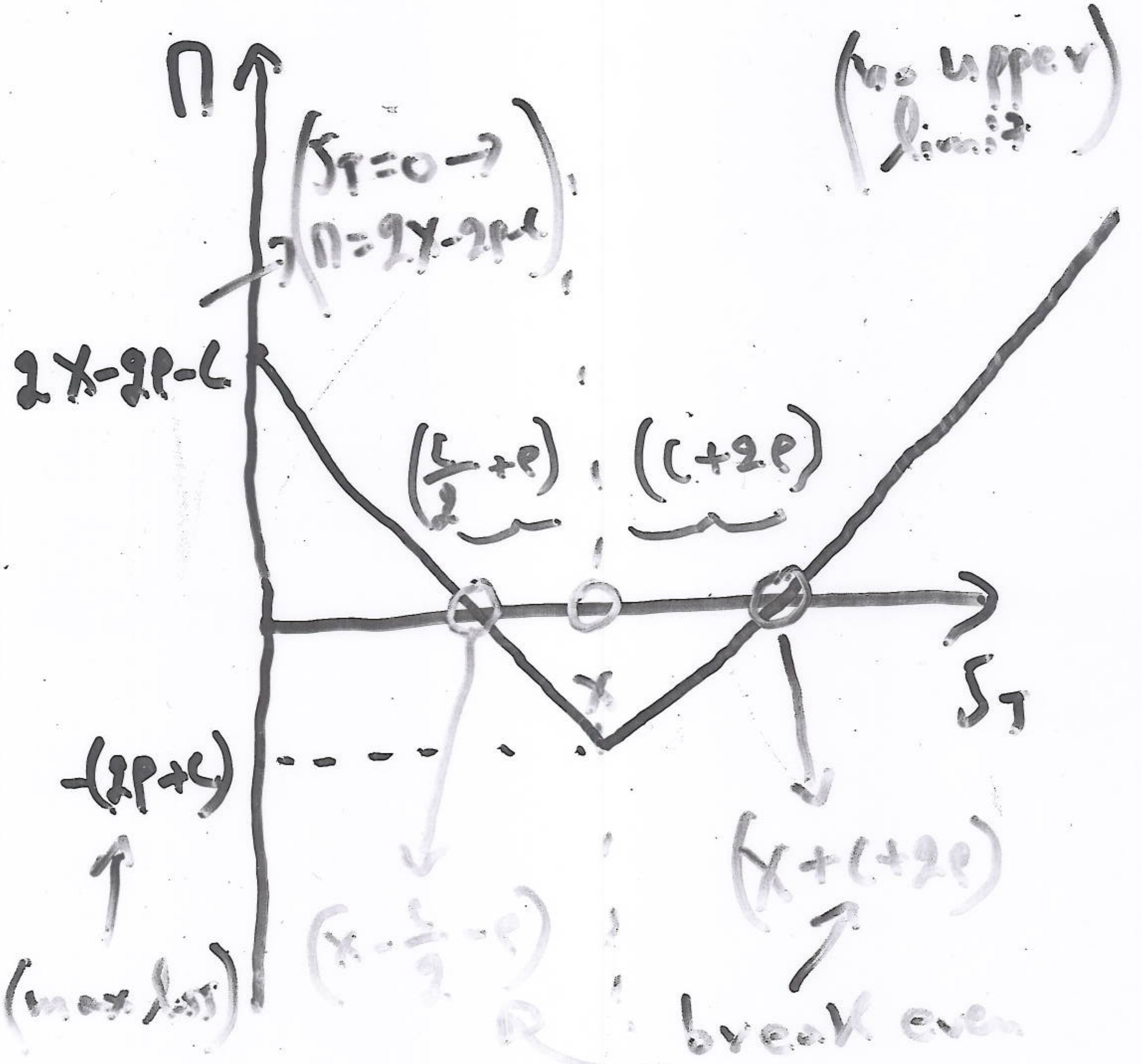
REVERSE STRADDLE

sp c(x), sp p(x)



STRIP

lp C(X), 2lp P(X)



$S_T = X \rightarrow \Pi = -(2p+c)$

$\Pi = 0 \rightarrow S_T \begin{cases} X + c + 2p \\ X - \frac{c}{2} - p \end{cases}$

REVERSE STRIP

Sp C(x), 2 Lp P(x)